PROGRESS
IN POLLUTION PREVENTION

4th ANNUAL REPORT

Government of Canada
Gouvernement du Canada

Canada

Progress in Pollution Prevention 1998-1999: Annual Report of the Pollution Prevention Coordinating Committee

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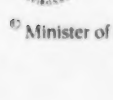

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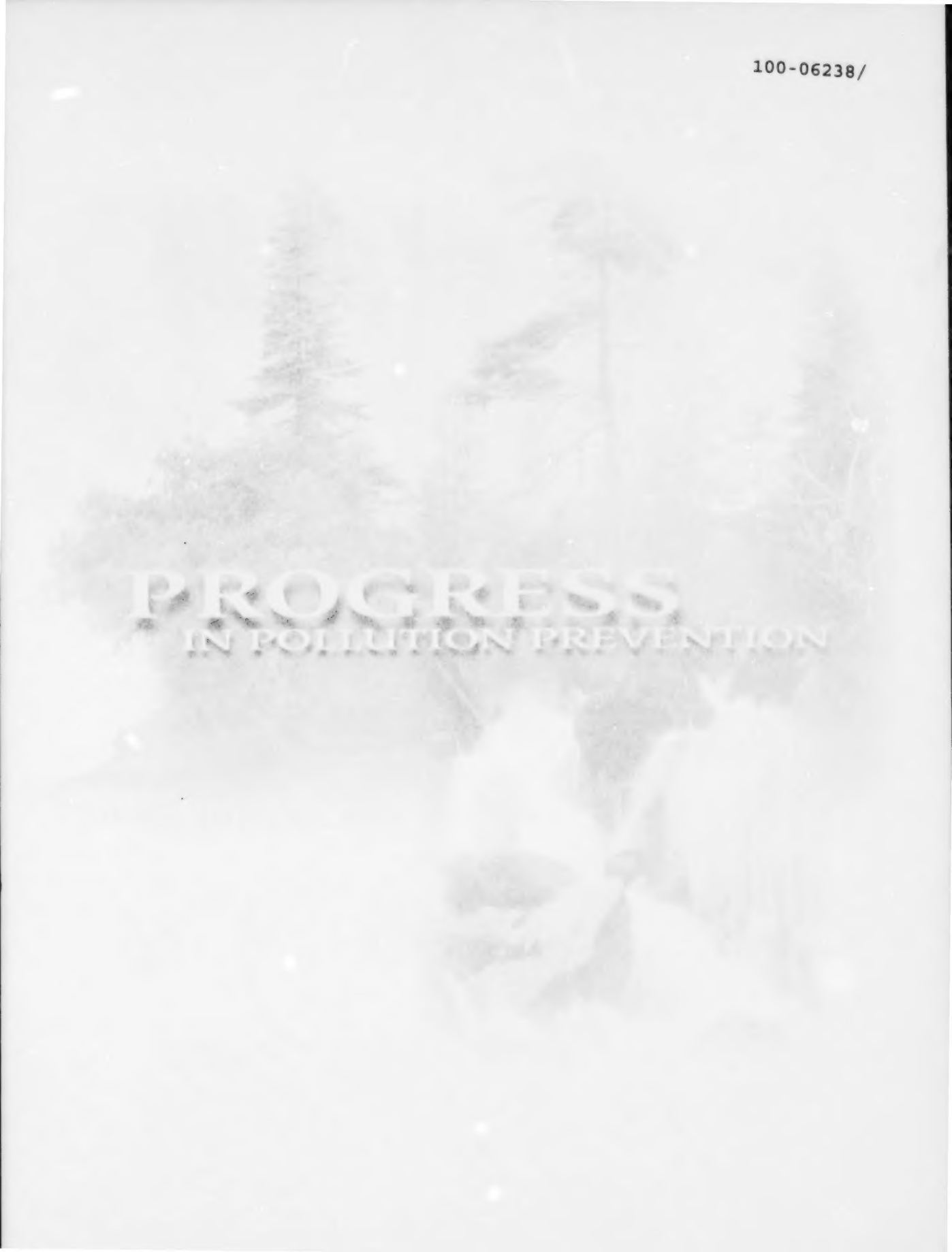

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Minister's Message

I am pleased to present the fourth annual report of the federal Pollution Prevention Coordinating Committee (P2C2) — *Progress in Pollution Prevention 1998-1999*.

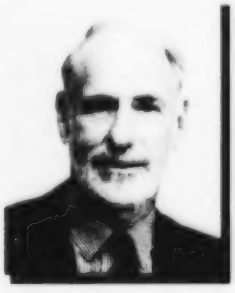
This is the first year the report is published as a Government of Canada document. This demonstrates the continued cooperation of pollution prevention initiatives across the federal government; the report also provides a more comprehensive record of the Government's pollution prevention activities.

Progress in Pollution Prevention 1998-1999 highlights the federal government's achievements in cooperation with other governments, the private sector, the international community and with individual Canadians in incorporating pollution prevention initiatives into its operations from April 1998 to March 1999. The responsibility lies with all of us to ensure that Canada becomes a model of environmental excellence, not only in government operations, but in all areas of the economy and society.

The initiatives profiled in this year's report show how the Government of Canada is advancing pollution prevention by working in partnership with the private sector. Together, we are developing pollution prevention programs, guidelines and codes of practice for industrial operations and international agreements for global action. We are also supporting local community action projects that promote energy efficiency and water conservation.

From coast to coast to coast, individual Canadians, private industry and governments are contributing to this effort by recognizing that minimizing or avoiding the creation of pollutants is a more cost-effective method of environmental protection than treating or cleaning-up pollutants after they have been created or released into the environment. These changes lead to lower production costs, increased efficiencies and better environmental protection policies.

This report reinforces the Government of Canada's priorities which stress regular reporting by federal government departments and continued and improved access to the information Canadians need to make informed decisions about human health and environmental matters, including clean air and clean water. A clean and healthy environment is essential for Canada's long-term economic and social well-being — it is critical in achieving a higher quality of life and sustainable development for all Canadians.



The Honourable David Anderson
Minister of the Environment

"THE GOVERNMENT OF CANADA is taking a strong leadership role in environmental protection by making pollution prevention the cornerstone of the new *Canadian Environmental Protection Act*, 1999."

The Honourable David Anderson
Minister of the Environment

Executive Summary

Canada stands committed to pollution prevention as the most effective means of protecting human health and the environment.

Progress in Pollution Prevention 1998-1999 showcases the federal government's achievements in incorporating pollution prevention into its own activities and those of its partners. This is the fourth annual report prepared by the federal Pollution Prevention Coordinating Committee. The report focuses on the progress made against the goals stated in the Federal Pollution Prevention Strategy and Action Plan during the year ending March 31, 1999, and demonstrates the federal government's leadership and commitment to pollution prevention. This year, all federal departments were encouraged to record their prevention efforts, and actions were taken to provide more results-based reporting.

Pollution Prevention—A Federal Strategy for Action sets priorities for action based on the five target sectors: federal departments and agencies, other orders of government, the private sector, individual Canadians and the international community. By directing efforts toward preventing pollution instead of managing it after it has been created, the federal strategy works toward the ultimate environmental goal of sustainable development.

This Year's Accomplishments

The Government of Canada is advancing pollution prevention through modernizing legislation and regulations; developing pollution prevention programs, guidelines and codes of practice for industrial operations; working in partnership with the private sector, other orders of government and communities; supporting non-regulatory initiatives; and participating in developing and implementing international agreements.

Progress within the Federal Government

The *Canadian Environmental Protection Act* has been revisited and strengthened by making pollution prevention the cornerstone of national efforts to reduce toxic substances in the environment. The renewed Act contains new powers for getting toxic substances out of the environment, avenues for greater citizen participation, new powers for the control of pollutants and waste, tools for further enforcement, and provisions for strengthening and extending partnerships with key stakeholders.

Federal initiatives, such as the Toxic Substances Management Policy, Greening of Government Operations and the National Pollutant Release Inventory, remain the foundation for the more detailed policy, operational and measurement frameworks needed for successful delivery of preventive environmental care. In greening operations, Agriculture and Agri-Food Canada, Public Works and Government Services Canada and the Department of National Defence have undertaken energy and water conservation initiatives. These initiatives are realizing significant savings. Vehicle fleet management initiatives employed by Transport Canada, Natural Resources Canada and Environment Canada have resulted in improved vehicle performance and reductions in greenhouse gas emissions.

Departments are using pollution prevention to meet or exceed the requirements of environmental regulations and policies. The Department of National Defence is actively promoting the reduction of toxic substances through eliminating substances such as CFC-113 and halon. Public Works and Government Services Canada reported more than half of its Crown-owned facilities pesticide-free this year.

Federal departments are committed to providing general environmental awareness training to all staff. They are moving toward specific pollution prevention training to address environmental liabilities for internal operations and external clients.

Progress with Other Governments

Through the Canada-Wide Accord on Environmental Harmonization, the Canadian Council of Ministers of the Environment, federal, provincial and

territorial governments and agencies are working collaboratively to achieve Canada-wide standards for toxic substances management. These standards will provide a basis for implementing consistent and uniform prevention and control measures and operating standards for industrial facilities across Canada.

Environment Canada continues to lead work on ecosystem initiatives, including initiatives for British Columbia's Georgia Basin, the Northern Rivers that flow through Alberta and the Northwest Territories, and the Great Lakes Basin. Environment Canada also provides technical and strategic support to local governments including the Halifax Regional Municipality.

Recent joint efforts of the provincial and federal governments to address climate change and acid rain will create future opportunities to prevent pollution through initiatives such as "green power"—electricity produced from renewable resources.

The health concerns faced by northern Canadians and First Nations in their environments received renewed focus through international agreements and community-based activities.

Progress with the Private Sector

Investment in research and development has led to new and innovative ways of preventing pollution at home and abroad. The National Research Council, Natural Resources Canada, Industry Canada and Environment Canada have provided technical and financial support to commercialize and market Canadian pollution prevention technologies through programs such as the Industrial Research Assistance Program, Climate Change Action Fund and Technology Partnerships Canada, through research institutes such as Environment Canada's Environmental Technology Centre, and through bilateral projects with other countries funded by the Canadian International Development Agency and other donors. Many of these technologies are promoted through Canadian Environmental Solutions, an Internet-based information tool.

Through agreements with private sector corporations and associations, governments in Canada are pursuing non-regulatory approaches to reduce the use of toxic substances. Through voluntary participation in the Accelerated Reduction and Elimination of Toxics (ARET) program, industry and government departments have made progress toward the stated ARET goals and are committed to further reductions in releases to the environment. Other private sector initiatives profiled in this report include: best environmental practices for the agriculture industry, led by Agriculture and Agri-Food Canada; environmental management plans for small craft harbours, led by Fisheries and Oceans Canada; and the prevention and treatment of mine, mill and metallurgical effluents, led by Natural Resources Canada.

The unique needs of small and medium-sized enterprises have been recognized by Environment Canada through programs that address green procurement, energy efficiency, environmental management and technological support.

Progress with the Canadian Public

Citizens and consumers were provided with improved access to pollution prevention information through Internet products such as the Canadian Pollution Prevention Information Clearinghouse and the Water Efficiency Experience Database.

Local community action to address environmental issues receives continued support through projects that promote energy efficiency, water conservation and environmentally responsible products and services. Projects are aimed at a variety of public audiences including households, recreational boaters and consumers.

Progress with the International Community

The Government of Canada continues to represent Canada's environmental interests abroad by participating in the development and implementation of protocols and conventions for global action, and through scientific cooperation. The year 1998-1999 marked the signing of the Kyoto Protocol, the signing and ratifying of both the Persistent Organic Pollutants and Heavy Metals Protocols and the ratifying of new amendments in the Montreal Protocol.

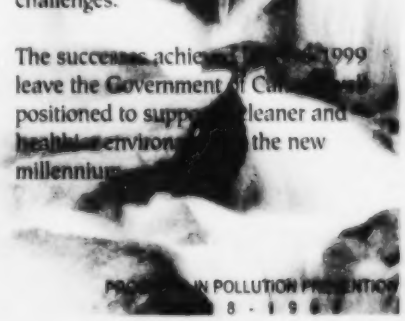
The Canadian International Development Agency continues to promote pollution prevention abroad through the implementation of environmental technologies in sectors such as petroleum, textiles and manufacturing. The Government of Canada remains an active participant in initiatives aimed at the Asia-Pacific region, including the China-Canada Cooperation Project in Cleaner Production, the Program of Action on Sustainable Cities and various technology exchange programs.

National Defence began the first year of a three-year joint project with the United States Department of Defense and the private sector. The Canada-United States Hard Chrome Replacement Project is aimed at replacing the chrome electroplating process currently used to refinish aircraft landing gear components with a more environmentally responsible replacement technology.

Moving Forward

This report, *Progress in Pollution Prevention 1998-1999*, highlights initiatives which confirm that the practice of pollution prevention is expanding across the targeted sectors and that the techniques and processes used for pollution prevention are evolving to address regional and global challenges.

The successes achieved [illegible] 1999 leave the Government of Canada well positioned to support a cleaner and healthier environment in the new millennium.



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Strengthening the Pollution Prevention Framework

The policies that support pollution prevention are designed to protect the health of Canadians and the environment as well as provide direction and consistency to all sectors of the Canadian economy.

The federal government defines pollution prevention as: *The use of processes, practices, materials, products or energy that avoid or minimize the creation of pollutants and waste, and reduce overall risk to human health or the environment.* Pollution prevention seeks to eliminate the causes of pollution rather than to treat the waste generated. It involves continuous improvement through design, technical, operational and behavioural changes. Pollution prevention encourages changes that are likely to lead to lower production costs, increased efficiencies and more effective protection of the environment.

POLLUTION PREVENTION PRACTICES AND TECHNIQUES

Using and conserving natural resources efficiently

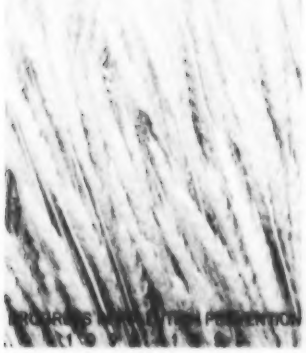
Substituting "clean" and green materials and feedstock

Thinking "green" for purchasing, product design and reformulation, process changes, equipment modifications and production

Reducing inputs and waste, on-site reuse and recycling

Training everyone in pollution prevention techniques

Introducing cleaner operating practices



Pollution prevention practices and techniques focus on such areas as: substances of concern, efficient use and conservation of natural resources, reuse and recycling on-site, materials and feedstock substitution, operating efficiencies, training, procurement techniques, product design, process changes, product reformulation, equipment modifications and clean production.

Pollution prevention:
- Minimizes or avoids the creation of pollutants
- Prevents the transfer of pollutants from one medium to another
- Accelerates the reduction and/or elimination of pollutants
- Minimizes health risks
- Promotes the development of source reduction technologies
- Uses energy, materials and resources more efficiently
- Reduces the need for costly enforcement
- Limits future liability with greater certainty
- Recognizes that waste is a cost that can be reduced
- Avoids costly clean-up in the future
- Promotes a more competitive economy

THE ENVIRO... HIERARCHY

The long-term goal of ... to prevent the creation of ... and to produce durable, ... hazardous goods. While ... protection methods ... opportunities for ... health risks and ... the top of the environ... Pollution prevention is ... Approaches that avoid ... of pollutants and waste ... methods such as off-site ... remediation, disposal, ... recovery. These are ... protection efforts, but are ... avoiding the creation of ... first place.

Federal Pollution Prevention Strategy

Pollution Prevention—A Federal Strategy for Action is the Government of Canada's policy framework for advancing pollution prevention as the cornerstone of environmental protection. Endorsed by the federal ministers in June 1995, the strategy elaborates on government policy and sets priorities for action based on five goals involving partnerships with federal departments and agencies, other orders of government, the private sector, individual Canadians and the international community.

The goals of the Federal Pollution Prevention Strategy include the following:
- Within the federal government: institutionalize pollution prevention across all federal government activities
- With other governments: foster a national pollution prevention effort
- With the private sector: achieve a climate in which pollution prevention becomes a major consideration in industrial activities
- With all Canadians: provide access to the information and tools necessary

to implement pollution prevention practices
- With the international community: participate in international pollution prevention initiatives

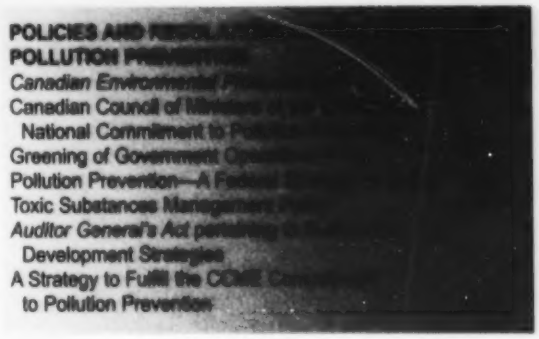
Federal Pollution Prevention Coordinating Committee

Established in 1992, the federal Pollution Prevention Coordinating Committee (P2C2) collectively promotes the implementation of *Pollution Prevention—A Federal Strategy for Action (1995)* by encouraging the practice of pollution prevention throughout the federal government and with the federal government's clients. Environment Canada chairs the committee. The current committee members, listed below, consist of representatives from 10 federal departments and agencies, two more than the previous reporting year:

- Environment Canada
- Natural Resources Canada
- Industry Canada
- The Department of National Defence
- The Canadian International Development Agency
- Fisheries and Oceans Canada
- Public Works and Government Services Canada
- Transport Canada
- The Department of Foreign Affairs and International Trade
- Agriculture and Agri-Food Canada

Progress in Pollution Prevention, the annual report of the P2C2, was first published in 1996. This annual report informs Canadians and government officials of both national progress in pollution prevention and pollution prevention achievements and successes across the country. By relating progress to the five target sectors of the Federal Pollution Prevention Strategy and Action Plan, this progress report provides a framework for monitoring performance and profiling federal environmental successes.

The first three annual reports of the P2C2 were published as Environment Canada documents. This year's report is published as a Government of Canada document in recognition of pollution prevention's continued promotion across federal government departments. The number of federal department and agency contributors to this report has expanded from seven last year to 21 this year.



Putting the Strategy into Practice

Within Canada, jurisdiction for the environment is shared by the municipalities, provinces, territories and the federal government. The Canadian Council of Ministers of the Environment (CCME) has become Canada's premier forum for intergovernmental discussion and action on environmental issues. The Council comprises environment ministers from the federal, provincial and territorial governments. Its mandate is to improve environmental protection and promote sustainable development in Canada.

In 1993, the CCME contributed to the evolution of pollution prevention in Canada by releasing the *National Commitment to Pollution Prevention*. In May 1996, the CCME again addressed pollution prevention by releasing *A Strategy to Fulfill the CCME Commitment to Pollution Prevention*. This strategy sets out a shared vision, mission and goal statement as well as guiding principles for the implementation of pollution prevention by all provinces, territories and the federal government. As stated in the CCME strategy, pollution prevention is a shared responsibility among governments, individuals and industrial, commercial, institutional and community sectors.

The Government of Canada, along with stakeholders in the private sector, environmental non-government organizations, communities, labour and academia, is putting pollution prevention into practice through a mix of regulatory and non-regulatory instruments. This includes modernizing legislation and regulations, managing national programs, developing guidelines and codes of practice for industrial operations, supporting voluntary initiatives, ensuring accessibility to tools and information and implementing international agreements.

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THE ENVIRONMENTAL PROTECTION HIERARCHY

The long-term goal of environmental protection is to prevent the creation of pollutants and waste and to produce durable, recyclable, less hazardous goods. While all environmental protection methods provide some benefits, opportunities for reducing environmental and health risks and associated costs are greater at the top of the environmental protection hierarchy. Pollution prevention is highest on the hierarchy. Approaches that avoid and minimize the creation of pollutants and waste are preferred over other methods such as off-site reuse and recycling, remediation, disposal, pollution control and energy recovery. These are important environmental protection efforts, but are not as effective as avoiding the creation of pollution and waste in the first place.

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POLICIES AND REGULATIONS SUPPORTING POLLUTION PREVENTION	
Canadian Environmental Protection Act	1988
Canadian Council of Ministers of the Environment National Commitment to Pollution Prevention	1993
Greening of Government Operations Policy	1995
Pollution Prevention—A Federal Strategy for Action	1995
Toxic Substances Management Policy	1995
Auditor General's Act pertaining to Sustainable Development Strategies	1995
A Strategy to Fulfill the CCME Commitment to Pollution Prevention	1996

Putting the Strategy into Practice

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Progress within the Federal Government

Federal government departments, through the development and implementation of strategies, programs and projects, are institutionalizing pollution prevention within their operations.

ENVIRONMENT CANADA administers the pollution prevention sections of the *Fisheries Act* (sections 34-42), which prohibit the deposit of deleterious substances into water frequented by fish.

For certain industries, regulations have been developed under the *Fisheries Act* to limit the deposition of potentially deleterious substances to levels that can be proven by site-specific effects monitoring programs to have no effect on the receiving environment.

Fish habitat protection measures are addressed by Fisheries and Oceans Canada.

Legislation and Regulations

The Parliamentary Review of the *Canadian Environmental Protection Act* (CEPA) continued in 1998-1999. The Bill was referred to the Standing Committee on Environment and Sustainable Development on April 28, 1998. Hearings were completed on March 25, 1999. The renewed CEPA is expected to be in force by the spring of 2000, with pollution prevention the cornerstone. The renewed CEPA gives the government new powers to require pollution prevention planning for substances declared toxic under CEPA. Other provisions include:

- Implementing a "fast track" approach to evaluating and controlling toxic substances
- Ensuring the most harmful substances are phased out, or not released into the environment in any measurable quantity
- Improving enforcement of regulations
- Improving "whistle blower" protection to encourage more Canadians to report CEPA violations
- Allowing for more effective cooperation and partnership with other governments and Aboriginal peoples

Since environmental challenges, expectations, and legal and scientific knowledge are constantly evolving, the Act will be reviewed by a Parliamentary Committee every five years.

In 1998, the average level of sulphur in Canadian gasoline was 350 parts per million (ppm), among the highest in the industrialized world. Air quality regulations to lower the allowable level of sulphur in gasoline sold in Canada were proposed in October 1998. The proposed regulations would reduce the sulphur content in gasoline to an average level of 30 ppm; this represents a 90% reduction from average levels today. This requirement would be phased in over three years, from 2002 to 2005. A joint industry-government study estimated that over a 20-year period, low sulphur in Canadian gasoline will prevent over 2,100 premature deaths, 93,000 incidences of bronchitis in children, five million other health-related incidents such as asthma attacks, and 11 million acute respiratory symptoms. Also, 1998 was the first full year of application for regulations to control sulphur levels in on-road diesel fuel.

The Federal Smog Management Plan is helping reduce the release of particulate matter and ozone to the environment. During the summer months, every major Canadian urban centre has smog levels high enough to cause a health risk.

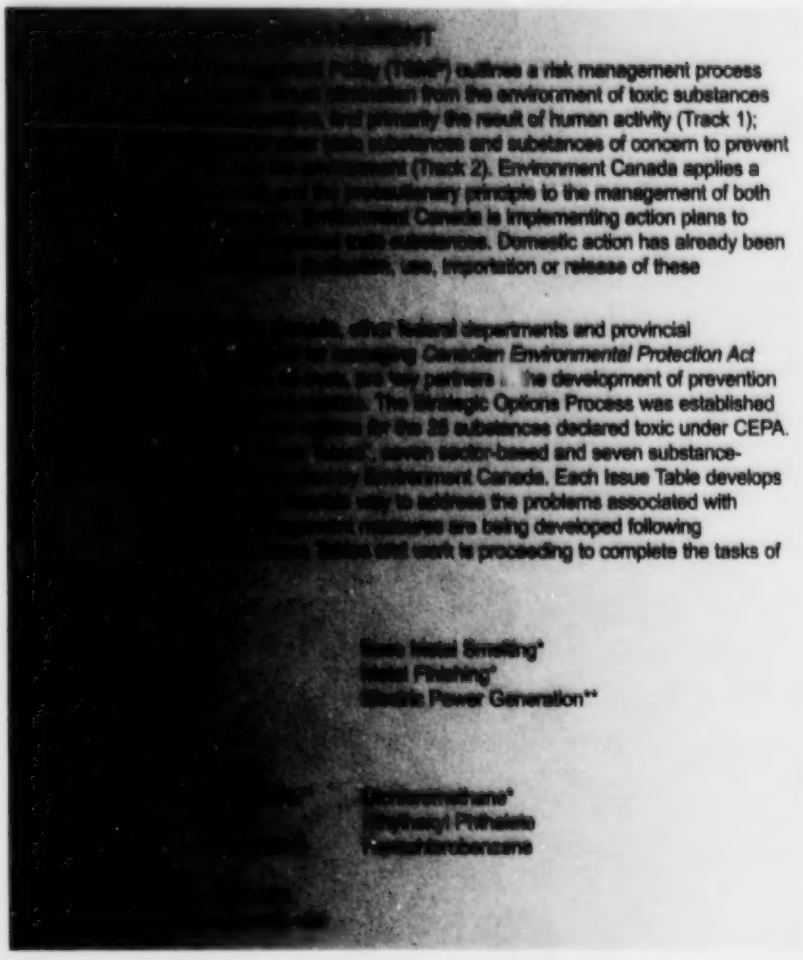
Toxic Substances/Clean Air

Based on the recommendations of the Dry Cleaning Strategic Options Report, prepared by Environment Canada and Health Canada, a proposal to regulate the use of perchloroethylene (PERC) in dry cleaning is

currently being drafted. This will result in the removal from service of first- and second-generation PERC dry cleaning machines (comprising 50-60% of existing machines). The proposal specifies solvent consumption rates for new dry cleaning machines and requires supplier take-back of PERC-contaminated waste. Discussion and consultation are ongoing with provincial fabricare associations regarding this proposal. The use of dry cleaning PERC is expected to be reduced from 5.5 kilotonnes in 1994 to 2.3 kilotonnes following the effective date in the proposed regulation.

Environment Canada and Health Canada completed a final draft report on the stakeholder consultations on dichloromethane. Dichloromethane is a versatile solvent used in a wide range of industrial process applications as well as being an active chemical in paint stripping and cleaning formulations. The control actions recommended in the report would reduce overall releases of dichloromethane from all uses by 50%, from about 6,300 tonnes to 3,100 tonnes/year. While implementation was originally to be undertaken through non-regulatory instruments, lack of participation by the industry sectors involved demonstrated that regulations would be more effective. Regulations are currently being drafted.

The National Pollutant Release Inventory (NPRI) was created to provide Canadians with information on the release of polluting substances into air, water and land. This information assists Environment Canada in the design of pollution prevention and abatement measures. In March 1999, the NPRI Ad Hoc Work Group on Substances released its recommendations to Environment Canada for adding 73 new substances to the NPRI. The NPRI will now provide information on 246 substances



of concern, of which 20 substances have been declared toxic under the *Canadian Environmental Protection Act*.

In September 1998, the Minister of Foreign Affairs presented a consultation paper entitled *Toward a Northern Foreign Policy for Canada*. It stated that Canada's new northern foreign policy would work toward achieving effective international measures to reduce transboundary contaminants and global climate change.

Environment Canada and its partners, Natural Resources Canada, Transport Canada, and Agriculture and Agri-Food Canada, are preparing a Phase 3 Federal Smog Management Plan. Phase 3 will be the initial federal implementation response to the new Canada-wide Standards on particulate matter and ozone, which are being developed under the Canadian Council of Ministers of the Environment.

currently being drafted. This will result in the removal from service of first- and second-generation PERC dry cleaning machines (comprising 50-60% of existing machines). The proposal specifies solvent consumption rates for new dry cleaning machines and requires supplier take-back of PERC-contaminated waste. Discussion and consultation are ongoing with provincial fabricare associations regarding this proposal. The use of dry cleaning PERC is expected to be reduced from 5.3 kilotonnes in 1994 to 2.3 kilotonnes following the effective date in the proposed regulation.

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The National Pollutant Release Inventory (NPRI) was created to provide Canadians with information on the release of polluting substances into air, water and land. This information assists Environment Canada in the design of pollution prevention and abatement measures. In March 1999, the NPRI Ad Hoc Work Group on Substances released its recommendations to Environment Canada for adding 73 new substances to the NPRI. The NPRI will now provide information on 240 substances of concern, of which 20 substances have been declared toxic under the *Canadian Environmental Protection Act*.

In September 1998, the Minister of Foreign Affairs presented a consultation paper entitled *Toward a Northern Foreign Policy for Canada*. It stated that Canada's new northern foreign policy would work toward achieving effective international measures to reduce transboundary contaminants and global climate change.

Environment Canada and its partners, Natural Resources Canada, Transport Canada, and Agriculture and Agri-Food Canada, are preparing a Phase 3 Federal Smog Management Plan. Phase 3 will be the initial federal implementation response to the new Canada-wide Standards on particulate matter and ozone, which are being developed under the Canadian Council of Ministers of the Environment.

TOXIC SUBSTANCES MANAGEMENT

The Toxic Substances Management Policy (TSMP) outlines a risk management process based on two key objectives: virtual elimination from the environment of toxic substances that are persistent, bioaccumulative, and primarily the result of human activity (Track 1); and life-cycle management of other toxic substances and substances of concern to prevent or minimize their release into the environment (Track 2). Environment Canada applies a pollution prevention approach and the precautionary principle to the management of both Track 1 and Track 2 substances. Environment Canada is implementing action plans to virtually eliminate the most dangerous toxic substances. Domestic action has already been taken to severely limit or ban the production, use, importation or release of these substances.

Environment Canada, Health Canada, other federal departments and provincial governments share responsibility for managing *Canadian Environmental Protection Act* (CEPA) toxic substances and, as such, are key partners in the development of prevention and control options for these substances. The Strategic Options Process was established in 1994 to develop management options for the 25 substances declared toxic under CEPA. Fourteen multi-stakeholder "Issue Tables", seven sector-based and seven substance-based, were established and chaired by Environment Canada. Each Issue Table develops recommendations for the most feasible way to address the problems associated with specific toxic substances. Management measures are being developed following recommendations from nine Issue Tables and work is proceeding to complete the tasks of the remaining five Tables.

TARGETED SECTORS

- Dry Cleaning**
- Solvent Degreasing**
- Wood Preservation
- Steel Manufacturing*
- Base Metal Smelting*
- Metal Finishing*
- Electric Power Generation**

TARGETED SUBSTANCES

- Benzidine/3,3'-Dichlorobenzidine**
- Refractory Ceramic Fibres*
- Short Chain Chlorinated Paraffins
- Dichloroethane
- Dichloromethane*
- Ethylhexyl Phthalate
- Hexachlorobenzene

* Recommendations made in 1998-1999

** Recommendations made before 1998-1999

DEFINING THE PRECAUTIONARY PRINCIPLE

"Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."
(Rio Declaration, 1992)

Sustainable Development and Environmental Management Systems

Pollution prevention helps protect the environment and make the Canadian economy more efficient and competitive, establishing it as a sound approach to achieving sustainable development. Twenty-seven departments and agencies are now required to prepare sustainable development strategies and action plans for tabling in the House of Commons. The Sustainable Development Strategy outlines each department's goals for integrating sustainable development into its policies, programs and operations. The Commissioner of the Environment and Sustainable Development is responsible for auditing these strategies. Environment Canada has coordinated and led federal efforts with respect to sustainable development through the Interdepartmental Network on Sustainable Development Strategies.

POLLUTION PREVENTION AND ENVIRONMENTAL MANAGEMENT IN GOVERNMENT OPERATIONS

Federal departments and agencies often share interests, mandates or responsibilities when it comes to government operations and sustainable development. Participation in interdepartmental groups is essential for addressing environmental accountability. This participation provides a forum for developing common tools, coordinating activities and sharing information.

Federal interdepartmental mechanisms in place to promote coordination include:

- **Deputy Ministers' Sustainable Development Coordinating Committee**
- **Interdepartmental Network on Sustainable Development Strategies**
- **Federal Committee on Environmental Management Systems**
- **Pollution Prevention Coordinating Committee**

An Environmental Management System (EMS) provides a systematic framework for practices, procedures and processes designed to help an organization manage its environmental obligations and document, evaluate and communicate its environmental performance. Led by Environment Canada, the Federal Committee on Environmental Management Systems continues to advance the effective implementation of departmental Environmental Management Systems. Federal departments such as the Department of Foreign Affairs and International Trade, Health Canada and Transport Canada have made significant progress in developing and implementing an EMS that incorporates pollution prevention principles. Agriculture and Agri-Food Canada has initiated a recurring departmental Environmental Management Review process in concert with its EMS to provide a basis for verifying and managing the implementation of more efficient and less polluting practices.

Waste Reduction

During this reporting period, construction, renovation and demolition (CRD) waste was diverted by Public Works and Government Services Canada in eight of 43 public works projects and reused on-site where feasible. For example, a demolition project in Pleasantville, Newfoundland, diverted from landfill windows, doors, electrical wire components, wood sheathing, structural wood members and framing, heating units (radiators, boilers), steel and copper piping and reinforcing steel from concrete foundations. The concrete itself was crushed and used as fill on-site. The Department also worked with National Defence to develop two publications for use by all Canadian Forces bases undertaking CRD projects.

A solid waste audit conducted at Transport Canada headquarters showed improvements in the Department's "No Waste" Program. For instance, the retrofitting of network printers for duplex printing has resulted in a 4% reduction in usage of single-sided paper.

At Canadian Forces Greenwood, 14 Wing integrated vermi-composting into its waste reduction plan to aid in the diversion of solid waste sent to landfill. The vermi-composting facility received an award from the Nova Scotia Department of

GREENING GOVERNMENT OPERATIONS

The Greening of Government Operations policy reiterates the federal government's commitment to comply with applicable environmental legislation. This includes, for example, all federal regulations under the *Canadian Environmental Protection Act* (CEPA) and the *Fisheries Act*. Part IV of CEPA (1988) gives the federal Minister of the Environment authority to regulate waste handling, disposal practices and emissions and effluents from the activities of federal organizations and to make regulations and guidelines for environmental protection that apply to federal lands, works and undertakings. To date, one regulation on federal PCB destruction, one guideline governing the use of glycol at federal airports, one guideline on the management of underground storage tanks and a regulation that requires annual storage tank compliance reporting have been introduced under Part IV. Examples of pollution prevention and other environmental protection actions being taken across the country to "green" federal departments and agencies are provided below.

WASTE MANAGEMENT
- Waste audits performed and updated annually
- Waste reduction action plans developed and implemented
- Recycling system in place; composting where feasible
- Hazardous waste collected centrally, stored and disposed of safely

ACTIONS TAKEN
The headquarters building for the Department of Justice undergoes an annual waste audit by Public Works and Government Services Canada. Zero-waste programs have been successfully implemented by Transport Canada, National Defence and Environment Canada.

WATER/ENERGY CONSERVATION
- Audits performed
- Conservation plans developed and implemented
- Water/energy-saving equipment and devices specified for future purchases (e.g. water-efficient fixtures, energy-efficient lighting and water heating)

ACTIONS TAKEN
The Department of Foreign Affairs and International Trade conducted energy audits of some of its buildings abroad to determine how they could be retrofitted for increased energy efficiency and to identify ways of reducing energy consumption.

VEHICLE FLEET MANAGEMENT
- Fuel efficiency maximized and alternative fuels used to conserve energy and reduce emissions
- Number of vehicles for departmental use reduced
- Emission testing and regular maintenance performed
- All used vehicle fluids and oils recycled

ACTIONS TAKEN
Transport Canada has helped reduce emissions by introducing nine dual-fuel (natural gas/gasoline) vehicles into Ontario Region's operations.

PROCUREMENT
- "Green" clauses included in service and supply contracts
- Harmful chemical usage minimized (cleaning products, solvents, oil-based paints)

ACTIONS TAKEN
Statistics Canada utilizes an automated material management information system, an internal system available to federal government departments. This procurement and inventory system provides access to all "environmentally preferred products".

TRAINING AND AWARENESS
- Staff trained in methods and informed of opportunities to conserve water and energy, reduce waste and make environmentally sensitive purchasing decisions
- Raising employees' awareness to optimize pollution prevention in their activities

ACTIONS TAKEN
Industry Canada has developed a training module on green procurement, a green driver training package and a catalogue on green products and sources. Environment Canada and Health Canada have developed similar materials for their employees.

REMEDIAL ACTIONS
- Equipment using CFCs and halons identified and alternatives introduced wherever possible
- Equipment containing PCBs phased out and PCBs not in use securely stored
- Fuel storage tanks to meet the new guidelines and be checked regularly for leakage

ACTIONS TAKEN
At year end, 67% of Public Works and Government Services Canada (PWGSC) facilities were reported free of PCBs. PWGSC has met all requirements of the Storage Tank Registration Regulations. PWGSC has decreased the ozone-depleting potential of chillers in Crown-owned PWGSC inventory.

Environment, Resource Recovery Board, for the "Most Innovative Manufacturing Initiative". Benefits include diverting solid waste from landfill as well as producing two marketable by-products: worm castings (fertilizer) and worms.

Natural Resources Canada has made significant reductions in its lab wastes. All sieves used in sample preparation and grain size analysis are made of metal rather than disposable nylon. One metal sieve can replace 500 to 1,000 disposable sieves, drastically reducing waste. Similarly, organic solvent waste from the use of acetone and methylene iodide has been eliminated through the reclamation and reuse of these two solvents.

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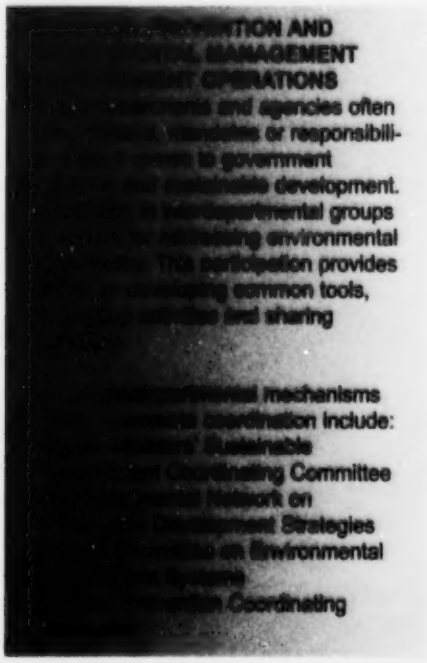

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GREEN PROCUREMENT

As the largest single buyer and property manager in Canada, the Government of Canada can play a leadership role in advancing green procurement. Federal government departments and agencies spend approximately $10 billion annually on contracts for goods and services.

Energy Efficiency/Water Conservation

The Federal Buildings Initiative (FBI) is a voluntary program developed by Natural Resources Canada to help government departments and agencies improve the energy efficiency of their facilities. The FBI reduces the cost of government operations, generates jobs and lowers greenhouse gas emissions. In many buildings, annual energy savings of 10 to 15% can be achieved by implementing relatively simple measures such as high-efficiency fluorescent lights and motors, and heating/cooling system upgrades. For instance, Health Canada initiated an FBI project in its Scarborough Laboratory with projected savings of $250,800 annually. Environment Canada was instrumental in implementing the first FBI in a leased facility; the resulting energy savings to the Crown were approximately $211,000 annually.

Agriculture and Agri-Food Canada's Lethbridge Research Centre is undertaking a lighting retrofit project. Not only will this initiative result in better quality light, but it will also save approximately 38,000 kilowatt-hours per year, resulting in a reduction of approximately 42 tonnes per year of carbon dioxide into the atmosphere.

National Defence has reduced energy consumption by 14% since 1989-1990. The Department has improved its energy efficiency by adopting energy conservation best practices and by investigating energy-saving contract opportunities. Energy performance contracts are ongoing at various Canadian Forces bases. Similarly, departmental use of water is down by 45% since 1989-1990. The reductions were achieved through the retrofitting and renovation of existing facilities and the design of new facilities.

Water conservation measures were implemented in 128 Crown-owned Public Works and Government Services Canada facilities by the end of March 1999. This represents 55% of building inventory in terms of floor area, up significantly from 33% last year.

Operations/Facility Management

During 1998-1999, the Environmental Marine Technical and Support Services Section of the Canadian Coast Guard (CCG) developed and implemented green policies with assistance from Environment Canada. Pilot projects involving environmental management and pollution prevention measures were implemented at CCG Base Prescott and on the ship CCGS SIMCOE.

More than half of the Public Works and Government Services Canada Crown-owned facilities were reported as pesticide-free for 1998-1999. Of the remaining facilities, 64 have established integrated pest management plans, a significant improvement over the 23 established in 1997-1998. A best-practice standard for integrated pest management will be developed and promoted by the Department.

National Defence has amended its Environmental Protection and Stewardship Policy to incorporate the principles of pollution prevention in day-to-day activities and operations. National Defence has also developed a Halocarbon Management System to manage halocarbons found in refrigeration, air-conditioning and fire-extinguishing systems. The intent of the system is to manage and monitor the use of halocarbons, which in turn will protect the ozone layer and reduce greenhouse gas emissions. The Canadian Forces eliminated the use of CFC-113, an ozone-depleting substance, from the processes used to clean aircraft oxygen systems and underwater diver breathing apparatus through the implementation of the U.S. Navy's Naval Oxygen Cleaning process. As well, upon examining total operations, National Defence identified 106 high-risk hazardous products, 55 (52%) of which were eliminated from use in 1998-1999 through pollution prevention techniques.

GREEN POWER

Environment Canada and Natural Resources Canada have set purchasing targets of 15-20% green power for their energy needs by 2010. Green power includes electricity produced from renewable resources such as wind, biomass, small-scale hydroelectricity or solar energy. By displacing existing power generation, green power reduces the emissions of carbon dioxide and other pollutants.

Photo: Tamara Gates

Environment Canada vehicle emission testing at Nova Scotia Community College resulted in inproved vehicle performance and reductions in harmful emissions.

The Natural Resources Canada (NRCan) Fleet Management Program has reduced greenhouse gas emissions through the reduction of vehicle inventory, more efficient use of the remaining vehicles and the adoption of alternative fuels. Since April 1, 1995, NRCan has reduced its fleet by 227 vehicles (32%), from 700 vehicles to 473. NRCan also has 92 alternative-fuel vehicles, 19% of the total fleet.

Working with a Halifax community college, Environment Canada had automotive students test its Halifax vehicle fleet for unacceptable emissions. Of 27 vehicles, seven did not meet Environment Canada's established emissions requirements and were subsequently either repaired and retested, or replaced. The testing resulted in improved vehicle performance and reductions in emissions of carbon dioxide and other pollutants, such as carbon monoxide.

Procurement

Environment Canada now uses EcoLogo™ cleaning products in its Queen Square, Dartmouth, offices. EcoLogo™ cleaners are used throughout the building and account for 77% of the cleaners. Carpets are cleaned with EcoLogo™ shampoo, and EcoLogo™ dish-washing soap and all-purpose cleaner are used in all staff kitchens. Using these cleaning products reduces the use and discharge of harmful chemicals.

Environment Canada's Atlantic Region designed and conducted a Green Hotel Survey to gather information about environmental initiatives at hotel facilities. The results provide staff with guidance in choosing environmentally responsible hotels for both meetings and accommodations.

Public Works and Government Services Canada continues to set up standing offers for "green" goods and services. As of March 1999, there were 70 "green" standing offers, including 56 national standing offers, 10 regional standing offers and four departmental individual standing offers (for alternative-fuel vehicles).

Training and Awareness

With input from Environment Canada, the Atlantic Canada Opportunities Agency established a focus group in October 1998 to develop training packages for its internal account managers. Upon receiving training, the account managers will be able to promote eco-efficiency (energy and resource efficiency) and support environmental industries across Atlantic Canada.

National Defence's Environmental Training Program provides training to Unit Environmental Officers (UEnvOs) through specialty topic lectures and General Environmental Awareness Training (GEAT). In 1998-1999, 150 UEnvOs were trained, 103 personnel received specialty topic lectures and GEAT was provided to over 1,500 personnel. In addition, the Department spent approximately $1.4 million on spill and emergency response equipment and approximately $400,000 on spill and hazardous materials training at various Canadian Forces bases.

Environment Canada's Quebec Region delivered pollution prevention training to employees of the Environmental Protection Branch. The training raised awareness among all 66 employees. Its objectives were to review the Federal Pollution Prevention Strategy and Action Plan and to increase pollution prevention activities in the Region. Similarly, Environment Canada's Pacific and Yukon Region delivered a pollution prevention information workshop to 85% of Whitehorse Environmental Protection staff.

Progress with Other Governments

All levels of government in Canada are working in close cooperation to ensure that environmental protection is effective and efficient.

National Partners

The Canadian Council of Ministers of the Environment (CCME) works to promote cooperation on and coordination of interjurisdictional issues such as waste management, air pollution and toxic chemicals. Under the mandate of the CCME, federal, provincial and territorial government agencies are developing Canada-wide standards for priority substances, including mercury, dioxins and furans, ozone and particulates, and benzene. Each standard will be accompanied by action plans for the strict control or virtual elimination of these substances from particular sources or classes of sources. These plans will outline the changes necessary to accomplish required objectives of meeting and maintaining the standards for a given source or class of source.

Provincial, Territorial and Municipal Partners

The Atmospheric Environment Service of Environment Canada and the provincial government water resources agencies are replacing mercury manometers with electronic instruments at water survey gauging sites across Canada. Since April 1996, 56%, or 466 of 828 mercury manometers have been replaced. Full replacement will remove 281 kilograms of mercury.

In October 1998, federal, provincial and territorial energy and environment ministers met in Halifax to sign the Canada-Wide Acid Rain Strategy for Post-2000. The Strategy commits governments to establishing targets and timelines for reductions in sulphur dioxide emissions. In keeping with the pollution prevention approach, the Strategy also commits governments to keeping clean areas clean (areas that, at present, do not exceed critical loads) and to employing pollution prevention strategies for all new sources of sulphur dioxide and nitrogen oxide.

The Ministers of Foreign Affairs and Indian and Northern Affairs Canada hosted the first ministerial meeting of the Arctic Council in Iqaluit in September 1998. The Council focused on protection of the Arctic environment and sustainable development as a means of improving the economic health and well-being of northern Canadians. Pollution prevention activities were included in the discussions.

Indian and Northern Affairs Canada, Environment Canada and Health Canada sponsored and participated in the Wskitqamu Maritime First Nations Environment Conference, which addressed environmental issues faced by the First Nations. About 60 First Nations representatives attended the two-day conference, which increased awareness of environmental issues, with pollution prevention highlighted as a preferred approach.

The City of Toronto, Toronto Renewable Energy Co-operative and Environment Canada are negotiating with Ontario Hydro to construct two wind turbines on the Toronto waterfront. Each wind turbine will generate 1,400 megawatt-hours of energy, enough to meet the needs of 250 to 300 households per year. Wind power produces no carbon dioxide, sulphur dioxide or nitrous oxide emissions.

The Georgia Basin Ecosystem Initiative was officially launched in December 1998 by Environment Canada and the British Columbia Ministry of Environment, Lands and Parks. The Initiative is being delivered in partnership with federal, provincial and local governments, First Nations, and community,

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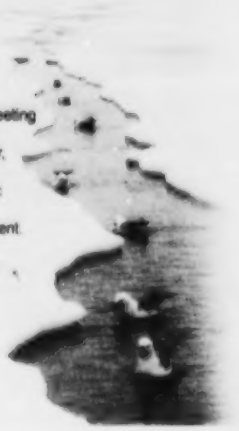
industry, university and non-government organizations. In all, over 100 projects were initiated during 1998-1999, aimed at achieving clean air and clean water and conserving and protecting species and habitat. Some projects will provide local governments and communities with scientific information and tools that will enable them to improve environmental quality and decision making around regional planning and growth strategies, liquid waste management plans and day-to-day decision making for sustainability.

The Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem (COA) coordinates federal and provincial action to enable Canada to respond to its commitments under the Canada-United States Great Lakes Water Quality Agreement. Under COA, the Great Lakes 2000 Program has made measurable environmental improvements in the Great Lakes Basin ecosystem through a cooperative effort of seven federal and four provincial ministries. For example, since 1994, pollutants in effluents from Ontario pulp mills have been reduced by over 82% and releases of dioxins and furans have been reduced by 77%.

The Northern Rivers Ecosystem Initiative was announced in February 1999 to address the impacts of the growing number of industrial developments, particularly pulp and paper and oil sands projects, within the Peace, Athabasca and Slave river watersheds. Under this initiative, the governments of Canada, Alberta and the Northwest Territories will focus on the issues of pollution prevention, contaminants and nutrients, endocrine disruption in fish, dissolved oxygen, hydrology and drinking water.

The Halifax Regional Municipality implemented the first phase of its Pollution Prevention Plan with continued technical support and strategic advice on at-source control issues from Environment Canada and the Nova Scotia Department of the Environment. Regulatory initiatives involved obtaining amendments in provincial legislation to accommodate municipal by-law changes toward pollution prevention and better enforcement. The educational aspect involved photo finishing, metal finishing and auto body repair business sectors in compliance promotion visits. Participants were also made aware of the technical support available through the Burnside Eco-efficiency Centre.



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Addressing Climate Change

In April 1998, Canada signed the Kyoto Protocol on Climate Change and made a commitment to reduce greenhouse gas emissions to 6% below 1990 levels by the 2008 to 2012 time frame. The National Climate Change Secretariat, which includes representatives from federal, provincial and territorial governments, is working to develop a National Implementation Strategy to meet Canada's commitment. The development of the national strategy involves 16 Issue Tables where 450 experts representing governments, the private sector, non-government organizations, universities and other organizations identify and assess greenhouse gas reduction opportunities. The Issue Tables report to federal and provincial energy and environment officials. Completion of the National Implementation Strategy is expected at the end of 2000.

1998 CCME POLLUTION PREVENTION AWARDS

The Canadian Council of Ministers of the Environment (CCME) [illegible] and organizations showing innovation or leadership in [illegible]. The [illegible] Prevention Awards were presented to:

Canadian Auto Collision of Brantford, Ontario, for [illegible] the amount of volatile organic compounds and dust produced in its [illegible] paint changes have resulted in cleaner air.

Lennox Industries (Canada) Ltd. of Etobicoke, Ontario, for [illegible] conservation and eliminating the use of 16 toxic substances in its [illegible]

Ford Motor Company of Canada, Limited, Windsor Casting [illegible] of ozonation technology to reduce cyanide by 70% in its [illegible] programs toward cleaner air, and its phenol reduction and [illegible]

Amici Enterprises Inc. of Calgary, Alberta, for its Envirowrapper, a [illegible] provides an effective, reliable and environmentally friendly [illegible] protecting pallet loads. Using the Envirowrapper reduces the [illegible] waste.

For more details on the CCME and these awards, visit the CCME [illegible]

industry, university and non-government organizations. In all, over 100 projects were initiated during 1998-1999, aimed at achieving clean air and clean water and conserving and protecting species and habitat. Some projects will provide local governments and communities with scientific information and tools that will enable them to improve environmental quality and decision making around regional planning and growth strategies, liquid waste management plans and day-to-day decision making for sustainability.

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Canadian Auto Collision of Brantford, Ontario, for significantly reducing the amount of solvents used and the amount of volatile organic compounds and dust produced in its auto repair shop. The process and paint changes have resulted in cleaner air.

Lennox Industries (Canada) Ltd. of Etobicoke, Ontario, for reducing greenhouse gases through energy conservation and eliminating the use of 16 toxic substances in its Ontario manufacturing facilities.

Ford Motor Company of Canada, Limited, Windsor Casting Plant of Windsor, Ontario, for its innovative use of ozonation technology to reduce cyanide by 70% in its wastewater, its particulate and odour reduction programs toward cleaner air, and its phenol reduction and recirculation programs toward cleaner water.

Amici Enterprises Inc. of Calgary, Alberta, for its Envirowrapper, a reusable, lightweight pallet wrapper. It provides an effective, reliable and environmentally friendly alternative to stretch wrap for stabilizing and protecting pallet loads. Using the Envirowrapper reduces the production and disposal of plastic packaging waste.

For more details on the CCME and these awards, visit the CCME website at: http://www.ccme.ca.

Progress with the Private Sector

Through partnerships, federal government departments are preventing pollution by facilitating the private sector development and adoption of clean processes and green technologies.

Industrial Pollution Prevention

The Accelerated Reduction and Elimination of Toxics (ARET) program is a multi-stakeholder pollution prevention and abatement initiative involving industry, health and professional organizations, as well as governments across Canada. ARET seeks, through voluntary actions, the virtual elimination of 30 persistent, bioaccumulative and toxic substances and significant reductions in emissions of another 87 toxic substances. Overall releases of toxics included in the ARET program have dropped by 52% from 1993 levels (27% from 1995 levels). An update report will be produced in early 2000. It will include results achieved up to December 1998.

ENVIRONMENTAL SOLUTIONS

To view the pollution prevention capabilities of Canada's best technology and service firms, visit Canadian Environmental Solutions (CES) at: http://strategis.ic.gc.ca/CES. Developed by Industry Canada, the CES site receives over 24,000 visits monthly.

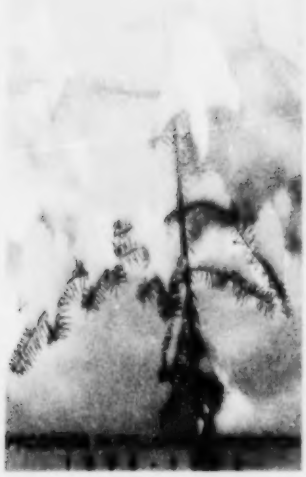
Environment Canada participated in the advisory committees for the British Columbia Ministry of Environment, Lands and Parks' industrial pollution prevention pilot projects at the Cominco Trail fertilizer operation and the Alcan Kitimat aluminum smelter. Pollution prevention plans for these two major industrial facilities were completed and implementation is underway.

Environment Canada reviewed the incorporation of pollution prevention in the design of a new sulphur terminal, a new ready-mix concrete plant and a new asphalt processing plant in British Columbia's Fraser River Basin. Pollution prevention guidelines for these and other industrial sectors were previously published by Environment Canada under the Fraser River Action Plan. Copies of the Fraser River Action Plan Final Report can be found at: http://www.pyr.ec.gc.ca.

Environment Canada, the *Ministère de l'environnement du Québec* and many partners launched Phase III of the St. Lawrence Action Plan, Vision 2000, which will be completed in 2003. Activities and projects with business and industry sector enterprises will be based on a pollution prevention approach. The industrial and urban component of the Plan targets 60 plants in three industry sectors: chemicals, metallurgy and metal processing. Activities under Phase III will promote voluntary action and sound environmental management practices, and the implementation of pollution prevention initiatives designed to reduce 18 toxic substances. Launched in 1988, the Action Plan has achieved a 96% reduction in toxic effluent discharged by 50 high-priority industrial plants in its first 10 years of operation. Studies, reports and fact sheets on the Plan and its results are now available at the Program's Internet site at: http://www.slv2000.qc.ec.gc.ca.

Natural Resources Canada's Office of Energy Efficiency (OEE) manages programs that target all energy consumers and emphasize partnerships and economic investments. Some initial indicators of OEE program success for 1999 include the following:

- Minimum performance levels are now regulated for more than 20 energy-using products that account for 65% of overall residential energy use. These regulations have greatly improved the energy efficiency of new household appliances and equipment.
- The Commercial Building Incentive Program received 147 applications for funding to help offset the additional cost of designing more energy-efficient commercial buildings. Eight projects received funding in the start-up year (1998-1999) of this three-year program.
- More than 249 industrial companies representing about 75% of industrial energy use have been recruited as Industrial Energy Innovators; as such they agree to adopt and achieve voluntary energy efficiency targets.



Sector-Specific Initiatives

Agriculture

Agriculture and Agri-Food Canada's $10 million National Soil and Water Conservation Program (NSWCP) provided funding in 1998-1999 for initiatives that encourage environmental sustainability in the agricultural and agri-food sector. For instance, the NSWCP has contributed to the expansion of agricultural environmental farm clubs in Quebec. Each club hires a consultant with agriculture and environmental expertise to work with each member to implement the best environmental practices for his/her operations. Club members learn about new methods of fertilization, pesticide use, soil conservation and management of water resources. In 1998-1999, there were 53 of these clubs, comprising 2,000 members. Other examples of NSWCP initiatives can be found at: http://www.agr.ca/cb/water.

In 1998-1999, the Hog Environmental Management Strategy (HEMS), a three-way partnership between the hog industry and federal and provincial governments, facilitated a coordinated approach to finding effective and affordable solutions to the environmental challenges the industry faces. Key environmental issues identified were: odour, air pollution, soil and water quality. HEMS' results include the launch of "Manurenet", which provides information on current research, available technologies and best management practices. HEMS is funded and led by Agriculture and Agri-Food Canada. For more information on HEMS, visit: http://res.agr.ca/manurenet.

Environment Canada initiated a livestock manure pollution prevention project in 1996. The project is co-chaired by Environment Canada and the Christian Farmers Federation of Ontario and is financially supported by various agricultural organizations and Ontario government ministries. The main objective of the project is to produce some verifiable approaches to reducing fish kills and fish habitat/water quality degradation caused by manure spills and runoff from livestock operations. Four brochures have been produced and distributed across Ontario. The brochures describe the environmental problems caused by manure spills and encourage farmers to manage their manure resources wisely by implementing management practices that protect the environment and improve their farm operations.

Automotive

The Canadian Automotive Manufacturing Pollution Prevention Project is targeted toward reducing toxic substances in the industry and involves the Canadian Vehicle Manufacturers' Association, DaimlerChrysler Canada Incorporated, Ford Motor Company of Canada, Limited, General Motors of Canada Limited, the Ontario Ministry of the Environment and Environment Canada. Total emission reductions since 1992 amount to more than 345,000 tonnes of pollutants. The 12,600 tonnes reduced this year include over 1,000 tonnes of volatile organic compounds and 70 tonnes of heavy metals. The project has been enhanced for better reporting and verification.

The Automotive Parts Manufacturers' Association (APMA) pollution prevention project task force published its Third Progress Report in December 1998. The Ontario Ministry of the Environment and others are involved with the APMA task force, as is Environment Canada, which provides project direction, technical advice and funding. Six APMA companies participated in the project task force, while 11 member companies have contributed a total of 44 documented case studies. Over 1,189 tonnes of substances of concern, including chromium, aluminum, xylene, trichloroethane and chromic acid, have been reduced and/or eliminated in the 44 case studies since December 1993. Approximately 70% of APMA members, or over 180 companies, have committed to ISO 14001 (a standard that deals with environmental management systems) for implementation in 1999. An ISO 14001 Implementation Guide has been developed for automotive parts companies in Canada.

HELPFUL ENVIRONMENTAL BUSINESS INFORMATION

Visit the Canadian Business Environmental Performance Office (BEPO), the one-stop centre for information and services for small and medium-sized Canadian businesses to improve their environmental performance, at: http://virtualoffice.ic.gc.ca/bepo. This site was developed jointly by Industry Canada and Environment Canada. It receives over 10,000 visits per month and is updated regularly.

Construction

Industry Canada is coordinating a multi-departmental Industry Task Force aimed at developing a best-practice protocol for solid waste diversion in the construction, renovation and demolition (CRD) industry. The project will develop language for inclusion in any contract where the owner wants to ensure that CRD waste is handled in an environmentally sensitive manner. The costs of the project are being borne by all the federal departments involved: Public Works and Government Services Canada, Environment Canada, Department of National Defence, Defence Construction Canada (a Crown corporation) and Industry Canada.

Dry Cleaning

In cooperation with the Ontario Ministry of the Environment and three fabricare associations, Environment Canada's Ontario Region provided project direction, technical advice and financial support in 1998 for five educational workshops involving the proposed federal perchloroethylene (PERC) regulations, pollution prevention and wet cleaning. Similarly, in Quebec Region, Environment Canada developed a best environmental practices training program for dry cleaners in cooperation with the *Regroupement des experts en entretien des textiles du Québec* (REETEX).

Finance

Environment Canada's Atlantic Region undertook a study to assess the effectiveness of 16 private and public lending institutions in promoting pollution prevention as a means of minimizing environmental risk. Also, the report provides a summary of best practices as identified in the survey conducted for the study. Lending institutions, small and medium-sized enterprises, libraries in Canada and the United States and government departments have requested over 200 copies. A copy of the report is available at: http://www.atl.ec.gc.ca/reports/creditworthiness.html

A multi-departmental Industry Task Force is developing a best practice protocol for solid waste diversion in the construction, renovation and demolition industry.

Public Works & Government Services Canada

Marinas/Harbours

A national Small Craft Harbours Environment Policy and environmental management system were developed in 1997 by Fisheries and Oceans Canada to address the environmental impacts of operations at harbours where fishing is practised. During 1998-1999, the Department established and implemented Environmental Management Plans for 230 of 522 Small Craft Harbour Authorities.

In Ontario, Environment Canada, together with the City of Oshawa and the Oshawa Harbour Commission, completed Phase 1 of the Oshawa Harbour Pollution Prevention Demonstration Site Project to address the problem of contaminated sediments. This project focuses on sediment management, dredging, beneficial use of dredged materials, alternative means of dealing with current dredged materials and quantification and control of sediment and associated contaminants from point and non-point sources. An environmental audit of the Oshawa marina was undertaken and pollution prevention recommendations were made including alternative ways of handling hazardous material management, recycling, boat storage and control of runoff from property. The City of Oshawa was also provided with alternative technologies

which would reduce the introduction of plastic material and sediment into the Oshawa Harbour.

The Department of Fisheries and Oceans has been working with Small Craft Harbour Authorities to establish and implement environmental management plans.

Metal Finishing

The task force operating under a Memorandum of Understanding between several metal finishing industry associations, the Ontario Ministry of the Environment and Environment Canada released its Fifth Progress Report in September 1998. There are 22 metal finishing companies participating in this pollution prevention project, with a total of 29 documented case studies. Eighty employees from 31 organizations have completed training in pollution prevention planning. Over 234 tonnes of waste were reduced and/or eliminated in 1998-1999, for a project total of almost 2,186 tonnes since June 1993.

Mining

The Mine Effluents Program, delivered from Natural Resources Canada's CANMET Mineral Technology Branch, focuses on research and development (R&D) related to the prevention and treatment of mine, mill and metallurgical effluents. Program activities include technical R&D work at the bench and pilot scale, and international technology transfer projects. Partners include the mining industry, provincial governments, associations, universities, other research organizations and consulting firms, and foreign governments. Results include reduced acid mine drainage due to development of effective inhibitors, improved removal of thiosalts and ammonia from mill effluents, improved water management tools and improved metal recovery from solid and liquid wastes. A related program is the Mine Environment Neutral Drainage 2000 Program, which concentrates on disseminating national and international information on acidic drainage. For more information on these programs, visit: http://envirolab.nrcan.gc.ca and http://mend2000.nrcan.gc.ca.

Printing and Graphics

The printing industry across Canada has partnered with government agencies to develop sector-wide environmental management programs based on pollution prevention principles. Activities across Canada include the Atlantic Green Printers Project, CleanPrint Ontario, B.C. Printing Project, Manitoba Green Printing Project and *Association des arts graphiques du Québec*. The programs are a result of a collaboration by regional printing associations and government agencies including Environment Canada's regional offices. The programs assist printers in reducing or eliminating wastes, at source, through voluntary actions resulting in environmental compliance, improved operations, less waste and financial savings. For more information, visit: http://www.cleanprint.org.

Recreational, Utility and Off-road Engines

Environment Canada has been negotiating Memoranda of Understanding (MOUs) with industry groups who manufacture recreational and utility engines, including diesel off-road engines, to voluntarily supply cleaner engines to the Canadian market. The engines are used for products such as personal water craft, chainsaws, lawn mowers, and construction and agricultural equipment. These MOUs are being pursued to secure near-term environmental benefits and could serve as a prelude to future emissions regulations.

Tourism

The Hotel Association of Canada, in partnership with Terra Choice Environmental Services and Environment Canada, has an ongoing hotel sector eco-rating program. Under the program, hotel operations are rated on environmental management. As of March 1999, a total of 19 hotels had been rated.

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THE INDUSTRIAL RESEARCH ASSISTANCE PROGRAM, a service of the National Research Council, helps small and medium-sized Canadian firms create and adopt innovative technologies. These technologies, some of which are related to pollution prevention, yield new products, create high-quality jobs, and make industry more competitive.

Transportation

The Hamilton International Airport (HIA) was declared a Pollution Prevention Demonstration Site in 1997 through a joint partnership between Environment Canada and TradePort International, the authority managing HIA. Projects successfully implemented include the use of aqueous parts washers, battery maintenance technology, canola-based hydraulic fluids, compostable fuel absorbents, EcoLogo™ degreasers and cleaners, glycol collection recovery and reuse, a hazardous material management system and water-based paints. These pollution prevention initiatives have reduced the use of hazardous materials, reduced the volume of hazardous wastes generated, lowered operating costs and improved workplace health and safety. A video, "Pollution Prevention at Airports", was produced documenting the results of this project.

Training and Awareness

In cooperation with the *Centre de Toxicologie du Québec*, the *Comité de santé environnementale du Québec* and the *Association des hôpitaux du Québec*, Environment Canada funded a training workshop on mercury management in health institutions. The workshop covered prevention measures designed to reduce the use of mercury at the source and to promote alternatives for equipment and instruments. Among other issues, it examined current practices, risks and prevention. Approximately 100 participants attended the workshop.

Environment Canada promotes green procurement within Manitoba's Institutional, Commercial and Industrial (ICI) sectors by supporting the Manitoba Green Procurement Network. In 1998-1999, four pilot projects were completed, weekly newsletters were initiated and two technical sessions were presented to 65 representatives of the ICI sector. The pilot projects targeted the health care sector, small and medium-sized enterprises and hazardous substances.

Environment Canada's EcoAction 2000, in partnership with Nova Scotia (NS) Power, NS Environment, NS Natural Resources and the Illuminating Engineering Society of North America, began a "Light Better for Less" conservation program. The program encourages the replacement of incandescent bulbs with readily available compact fluorescent, high-pressure sodium, or light emitting diode (LED) lamps. It focuses on small and medium-sized enterprises, such as tourism facilities and warehouses, with significant incandescent light usage. A one-year pay-back period is typical in high-use areas following conversion to LED lamps.

The ENVIROCLUB™ pilot project, developed by Environment Canada's Quebec Region, in cooperation with *Développement économique Canada*, introduced a group of small and medium-sized enterprises (SMEs) in the Trois-Rivières region to pollution prevention and environmental management. The project was aimed at demonstrating to SMEs that improving their environmental performance has advantages in terms of their firm's efficiency and competitiveness. Through four workshops and on-site technical support, a pollution prevention project or a plan to implement an environmental management system was developed for each participating factory. Encouraged by its success, Environment Canada intends to make ENVIROCLUB™ available across Quebec.

More than 400 fleets, representing about 85,000 vehicles, have registered with the Natural Resources Canada FleetSmart Program, which provides private sector fleet managers with information, workshops, technical demonstrations and training programs on fuel-efficient practices for fleet vehicles.

POLLUTION PREVENTION RESEARCH

The Natural Sciences and Engineering Research Council (NSERC) provides financial support to Canadian university researchers for advancing Canada's knowledge and understanding of the sources of pollution and for finding new and innovative ways of preventing that pollution. NSERC is involved in the recently launched National Fuel Cell Research and Innovation Initiative, spearheaded by the Government of Canada in consultation with provincial governments and the private sector to support Canada's fuel cell industry.

Through NSERC Research Grants, a researcher at DalTech (formerly known as the Technical University of Nova Scotia) has developed a state-of-the-art solar water-heating appliance that reduces energy consumption and lowers domestic water-heating costs by as much as 65%. The system is now being sold by Thermo Dynamics Ltd.

Another beneficiary of the discoveries stemming from NSERC grants is Kemestrie Incorporated. This company is developing and commercializing biorefinery technologies based on work conducted at the University of Sherbrooke. The technology transforms organic compounds from forestry, industrial and agricultural wastes into value-added products such as biofuels and fine chemicals (used in the treatment of cancers).

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Research and Development

The National Research Council's Institute for Chemical Process and Environmental Technology established an Environmental Management Office to develop *Design for Environment* technologies, process decision making and design aids with an emphasis on pollution prevention.

The Cansolv® system was developed by the National Research Council with technical assistance from Environment Canada's Quebec Region. Cansolv® technology can be applied in industrial processes involving the combustion of sulphur-containing fuels. The Cansolv® system contains a regenerable, high-efficiency process for selective absorption of sulphur dioxide (SO_2) from gas streams such as flue gas. Pure, water-saturated SO_2 gas is recovered by steam stripping. The recovered SO_2 can be reused in the process itself, or securely stored for future use on the site or elsewhere. The technology has been successfully applied in refineries, pulp and paper mills, smelters and acid production plants.

Statistics Canada, through an annual Survey of Environmental Protection Expenditures, collects data on the expenditures made by primary and manufacturing industries. Since 1994, the first survey year, businesses have steadily reduced their investment in end-of-pipe technologies while increasing their investment in cleaner integrated process changes. For instance, business investment spending in environmental protection totalled $1.7 billion in 1997, an 8.7% decrease from 1996. Investment spending in end-of-pipe processes (whose sole purpose is to abate undesirable substances resulting from production) declined by 16%. In comparison, investment in integrated process changes to prevent generation of pollutants resulting from production grew by just over 5%.

Technology Partnerships Canada is an agency of Industry Canada that makes high-risk, repayable investments in near-market product and process technology development. One of the agency's priorities is in the area of environmental technologies. During 1998-1999, $36 million was invested in 10 projects which leveraged approximately $81 million in private sector investment. Included in these projects were investments in the development of an improved refuelling system for hydrogen fuel cell powered vehicles and the development of ethanol derived from agricultural and forestry waste. For more information, visit: http://tpc.ic.gc.ca.

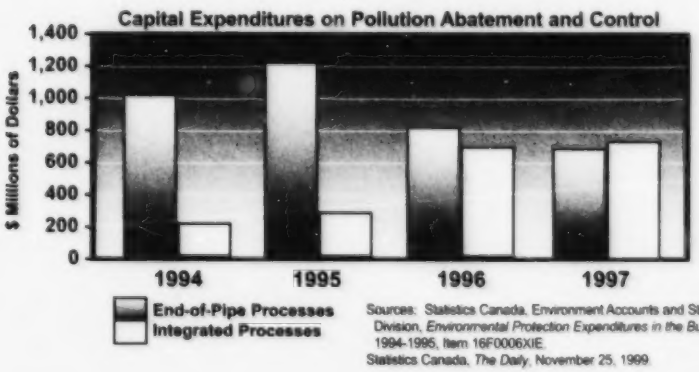
Natural Resources Canada continues to support hydrogen fuel cell research and development. Hydrogen fuel cell research has been ongoing for 15 years and addresses a wide range of opportunities and challenges ranging from fuel production, storage, transportation and distribution through to end use. The global fuel cell market is projected to be $100 billion by 2020.

Développement économique Canada, in partnership with Environment Canada's Quebec Region, established an alternative fuel vehicle technology platform. Two projects are currently underway. The ice resurfacer electrification project has resulted in the development of a non-polluting battery-powered electric vehicle to resurface ice in arenas. Electric Vehicles Montreal 2000 is a pilot project used to demonstrate how the use of electric vehicles can reduce carbon dioxide emissions by 3.8 tonnes per year per vehicle. This project received financial support from the Climate Change Action Fund.

The Multi-Dynamometer Simulator™ was developed by Environment Canada's Environment Technology Centre and serves as a diagnostic tool for vehicles, enabling mechanics to detect and correct engine, drive-train and brake problems that cause excessive fuel consumption and emissions of greenhouse gases and other pollutants. An operational unit was installed at the Ottawa-Carleton Transit Authority facility.

Environment Canada and Nortel Networks jointly analysed the energy, resources, materials and wastes associated with all stages of the manufacture, use and disposal of a telephone over 1997-1999. This project was designed to help identify alternative design features that use fewer and less harmful raw materials and processes, and less energy and packaging, and to promote maximum material recovery and recycling at end-of-life. Environment Canada will share key findings of this project with other Canadian manufacturers to demonstrate the environmental and economic benefits associated with using *Design for Environment* and life-cycle analysis as tools to reduce environmental impacts.

Natural Resources Canada's Program for Energy Research and Development (PERD) is aimed at developing an understanding of the nature and consequences of energy-related emissions such as carbon dioxide, nitrous oxide, sulphur dioxide and particulate matter as well as management strategies and technologies for their capture, storage and disposal. PERD will continue to support the development of alternative, more environmentally benign sources of energy including wind, photovoltaics, fuel cells, bioenergy and hydrogen. Recently, the program has chosen to support R&D which takes a more holistic approach to reducing energy usage and its associated effects by looking at the design of [illegible] community energy systems and transportation systems in a more integrated and synergistic fashion.



Sources: Statistics Canada, Environment Accounts and Statistics Division, *Environmental Protection Expenditures in the Business Sector, 1994-1995*, Item 16F0006XIE.
Statistics Canada, *The Daily*, November 25, 1999.

Progress with the Canadian Public

As consumers and citizens, Canadians have the power to make informed choices that promote pollution prevention, when equipped with reliable information and tools.

ECOLOGO™ PRODUCTS AND SERVICES

TerraChoice Environmental Services Inc., on behalf of Environment Canada, manages and delivers the Environmental Choice Program (ECP), an eco-labelling program that helps individuals, corporations and governments make informed purchasing decisions to reduce their environmental impacts. Over 2,000 brand-name products are now bearing ECP's EcoLogo™, products such as appliances, cleaners, electronics and paints. For more information, visit: http://www.environmentalchoice.com

Citizen-Driven Activities

EcoAction 2000, Nova Scotia (NS) Lung Association, NS Department of the Environment, NS Department of Natural Resources and other interested organizations are involved in a wood stove replacement program to improve air quality. Nova Scotians were encouraged to exchange their old, inefficient wood stoves for high-efficiency stoves. Owners traded in 126 wood stoves for new models, which reduce emissions by 90% and lower heating costs. Of the 126 stoves, 101 were recycled. The 126 stove trade-ins resulted in a reduction of 7.2 kilograms of wood smoke particulate per hour. The project reached an estimated 10,000 wood-burners through its educational materials and outreach campaigns on better burning practices.

The Green Communities Association, Maritime Electric Company and other organizations became involved in the Enviro-Home Visits program in Charlottetown, Prince Edward Island. With assistance from EcoAction 2000, the project conducted 99 home audits, and 57 homes underwent low to medium retrofits involving energy efficiency improvement activities (e.g. caulking, wind proofing, insulation). Through the installation of hardware and retrofitting, savings in fuel oil due to the project were estimated at 33,500 litres per year, a 10% reduction in fuel oil use. In 90 homes, water-saving devices were installed including ultra-low-flush toilets, toilet dams and low-flow shower heads. A follow-up survey showed that 24% of the 99 homes audited had stopped using any type of hazardous household cleaners.

Public Awareness Campaigns

Under EcoAction 2000, an educational campaign was undertaken to provide residents in the Chaleur region of New Brunswick with information on household hazardous products and environmentally responsible alternatives. This was done in conjunction with a household hazardous waste collection day.

ECOACTION 2000

EcoAction 2000 is an Environment Canada program that helps Canadians take action through community funding and public engagement initiatives. It provides tools and information to help Canadians make "down to earth" choices in support of a healthy environment. For more details, visit the EcoAction 2000 website at: http://www.ec.gc.ca/ecoaction.

Clean Marine Partnership members work toward preventing and reducing water, air and land pollution from recreational boating activities in Ontario through voluntary stewardship and pollution prevention initiatives. Key members include Environment Canada, Ontario Ministry of the Environment, Ontario Marina Operators' Association, Canadian Power and Sail Squadrons and other interested organizations. Accomplishments include the *Clean Marine Practices Handbook* and the *Enviro-Boater Guide*, both designed to provide tips and suggestions for environment-friendly boating. In 1998, the Eco-Rating Program, a certification and audit program, was developed for marinas, marine dealerships and yacht clubs. Achievements in 1999 included increasing the number of marine products certified by the Environmental Choice Program, and increasing participation in the Eco-Rating Program to 30 marinas.

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municipalities, the Association of Municipal Recycling Coordinators, the Regional Municipality of Hamilton-Wentworth and private industry on a project to eliminate mercury in households. The project objective is to educate the public about the hazards, reduction in use and proper disposal of household products containing mercury. An educational fact sheet has been developed and two workshops will be conducted. A survey is also underway to assess the present status of mercury recovery in Ontario municipalities and the awareness of mercury recovery at municipal household hazardous waste depots.

Access to Information

The Canadian Pollution Prevention Information Clearinghouse (CPPIC) is an Internet tool that provides pollution prevention information to Canadians. A variety of technical reports, fact sheets, manuals, environmental tip sheets, guides, legislation, regulations, programs, training materials and success stories are made accessible through CPPIC. Environment Canada is responsible for its development, maintenance and promotion. In 1998-1999, the number of references available on CPPIC doubled. Visit CPPIC at: http://www.ec.gc.ca/cppic.

The Internet-based Water Efficiency Experience Database was developed jointly by Environment Canada and the Canadian Water and Wastewater Association to facilitate and share information amongst water efficiency practitioners. Experiences described on the site come from all levels of government, institutions and the private sector. The site can be accessed at: http://www.cwwa.ca/wed.htm.

The second Canadian Pollution Prevention Roundtable "Demonstrating Results" was held in Winnipeg in 1998. Over 110 pollution prevention specialists representing business, consultants, universities, governments and non-government organizations joined forces to discuss pollution prevention issues and celebrate Canadian achievements. The event included a Total Cost Assessment workshop and a tour of pollution prevention efforts at Canadian Forces Base, Winnipeg. Environment Canada provided partial funding support and assisted in the organization of the event while the Canadian Centre for Pollution Prevention, a non-profit organization, launched and coordinated the event. For more information, visit: http://c2p2.sarnia.com.

Find out how some companies are using pollution prevention techniques in the "Success Story" section of the Canadian Pollution Prevention Information Clearinghouse web site.

Progress with the International Community

Canada continues to provide leadership and support abroad through international agreements, scientific cooperation and technology transfer.

AT THE SUMMIT OF THE AMERICAS

In 1994, Heads of State launched a Partnership for Pollution Prevention. As a follow-up, in August 1998 the Roundtable for the Americas for Cleaner Production was established in São Paulo, Brazil, to advance pollution prevention and cleaner production in this hemisphere. Participants included countries from South, Central and North America and the Caribbean.

International Agreements and Technology Transfer

Natural Resources Canada (lead department), in partnership with Industry Canada and Environment Canada, has established the three-year, $56 million Technology Early Action Measures component of the Climate Change Action Fund (CCAF). This component's objectives are to advance the development and commercialization of innovative technologies that reduce greenhouse gas (GHG) emissions; to support community-based GHG emission reduction technology demonstration projects; and to transfer Canadian GHG emission reduction technology to other countries, particularly developing nations. In 1998-1999, 23 projects representing a financial investment of $23 million were approved.

In June 1998, Canada signed the Persistent Organic Pollutants (POPs) and Heavy Metals Protocols in Denmark, with countries of the former Soviet Union, Europe and the United States, committing to reduce atmospheric emissions of 16 POPs and three heavy metals (lead, mercury and cadmium). POPs include industrial chemicals such as PCBs, pesticides such as DDT and toxaphene and contaminants such as dioxins and furans. Concentrations of these substances can be found in the Arctic, the Great Lakes and the St. Lawrence River Basin. The Protocols are the first major multinational, legally binding agreements to place controls on the hazardous air pollutants that particularly affect northern Canadians because of their long-range transport capabilities. Canada was the first country to ratify both Protocols in December 1998.

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In 1998, Canada was the first country to ratify new amendments to the Montreal Protocol on substances that deplete the ozone layer. The amendments make trade in banned ozone-depleting substances (ODS) tougher and accelerate the elimination of methyl bromide, an ozone-depleting pesticide. Since the signing of the Montreal Protocol in 1987, new supplies of ODS in Canada have fallen from 27.8 kilotonnes to 0.85 kilotonnes. Canada has reduced its consumption of methyl bromide by 48.5%.

Environment Canada, under bilateral agreements on environmental cooperation with developing countries and countries with economies in transition, held 14 capacity-building workshops and seminars. These events showcase Canadian environmental technology and know-how in pollution prevention, cleaner production, environmental impact assessment and climate change.

The Canadian Office for Technology Exchange in the Environment (COTE) is an organization established within the Environmental Affairs Branch of Industry Canada. COTE coordinates and implements a wide number of initiatives aimed at facilitating the transfer of Canadian environmental technologies abroad, some of which are related to pollution prevention. COTE administers and participates in a number of Memoranda of Understanding (MOUs) on Environmental Cooperation with countries such as Argentina, Brazil, Chile, Uruguay, Egypt, China, Poland, Cuba and Taiwan. The MOUs provide frameworks for bilateral exchanges of environmental technologies, goods and services.

The Canada-United States Strategy for the Virtual Elimination of Persistent Toxic Substances in the Great Lakes, also known as the Binational Strategy (BNS), was signed in 1997. The BNS sets reduction targets in the time frame 1997 to 2006 for specific toxic substances. Seven workgroups have been formed to identify ways to virtually eliminate these toxic substances from the Great Lakes Basin. Some of the workgroups are in the initial stages of gathering information regarding baseline levels and sources of the substances, while others have moved on to identifying cost-effective options to achieve reductions. The substances the workgroups address are mercury, hexachlorobenzene/benzo(a)pyrene, PCBs, dioxins and furans, octachlorostyrene, alkyl-lead and pesticides. For more information, visit: http://www.epa.gov/glnpo/bns.

The United Nations Environment Programme (UNEP) has been actively promoting the Cleaner Production Strategy since 1989 and has drafted an International Declaration. The signing of the Declaration was launched in September 1998 in Korea at UNEP's fifth High Level Seminar on Cleaner Production. The Declaration is voluntary and open to leaders from public, private and non-governmental organizations worldwide. The ultimate goal of the Declaration is to spread awareness of the Cleaner Production Strategy and encourage wide-scale adoption of the Strategy to achieve sustainable production and consumption. Environment Canada provided input on the wording of the Declaration to ensure that it complemented Canadian policy on pollution prevention as the preferred approach to environmental protection. More information on the status of the Declaration can be obtained by visiting the UNEP website at http://www.unepie.org.

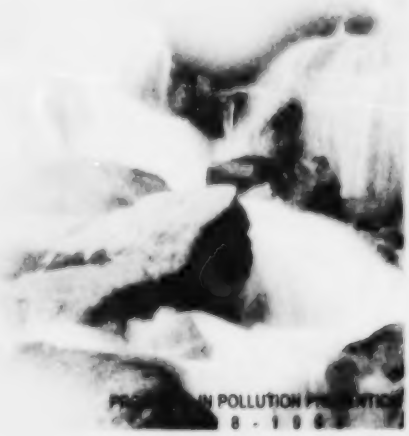
THE CANADIAN INTERN
The Canadian International
enable pollution prevention
projects implemented in
other federal departments.

Alliance for Sustainable
Economy and Environment
Conservation and Sustainable
Biogas II (India)
Small Projects Environmental
Multipurpose Waste Recycling
Boiler Emission Upgrade (India)
Water and Energy Commission
Training and Visits (Malaysia)

North, Central and South America

ARPEL Environmental Services, a non-profit organization based in Alberta, is working with its member companies to develop and implement environmental protection technologies in the Latin American petroleum sector through information exchange, training and assistance. This phase consists of seven major projects: Contingency Planning, Atmospheric Emissions, Environmental Audits, Energy Efficiency, Environmental Costs, Environmental Training and Environmental Guidelines. The Canadian International Development Agency provided financial support for these projects, which resulted in a series of regional workshops in Latin America.

During 1998-1999 National Defence began the first year of a three-year joint project with the U.S. Department of Defense and the private sector. The Canada-United States Hard Chrome Replacement Project is aimed at replacing the chrome electroplating process with high-velocity oxy-fuel and physical vapour deposition thermal coating technologies. The project will develop a more environmentally responsible replacement technology to the chrome electroplating process currently used to refinish aircraft landing gear components.



Progress with the International Community

Canada continues to provide leadership and support abroad through international agreements, scientific cooperation and technology transfer.

AT THE SUMMIT OF THE AMERICAS

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THE KYOTO PROTOCOL

In Kyoto, Japan, Canada and 160 other countries agreed to a Protocol that called for further reductions in greenhouse gas emissions over the next 15 years. Canada's reduction target is 6% below 1990 levels within the 2008 to 2012 time frame. Canada is working to develop the Buenos Aires Plan of Action, which provides a framework for finalizing the details of the Kyoto Protocol, and to facilitate ratification of the Protocol. Environment Canada, Natural Resources Canada and the Department of Foreign Affairs and International Trade are active in advancing negotiations on climate change and supporting the involvement of developing countries. Environment Canada participates in the World Climate Change Research Program and the Intergovernmental Panel on Climate Change.

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THE CANADIAN INTERNATIONAL DEVELOPMENT AGENCY

The Canadian International Development Agency has worked diligently to advance and enable pollution prevention internationally. Shown below are some pollution prevention projects implemented in 1998-1999 in conjunction with the private sector and a number of other federal departments.

Alliance for Sustainable Development (Central America)
Economy and Environment Program for Southeast Asia (Southeast Asia)
Conservation and Sustainable Utilization of Natural Resources in the Tarim Basin (China)
Biogas II (India)
Small Projects Environmental Fund (India)
Multipurpose Waste Recycling Project (India)
Boiler Emission Upgrade (India)
Water and Energy Commission and Secretariat Institutional Development Projects (Nepal)
Training and Visits (Malaysia)

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The Program of Action on Sustainable Cities is helping address the impact of urban activities on the environment.

Asia and Africa

The China-Canada Cooperation Project in Cleaner Production, a five-year project, began in early 1997. The Canadian International Development Agency provides technical assistance, services, administration, training, monitoring, and impact assessment on cleaner production activities in Canada. For instance, the Fuyang General Chemical Manufacturer Plant has achieved substantial savings in manufacturing costs and reductions in emitted pollutants by implementing cleaner production solutions as suggested by Canadian experts. By the beginning of 1999, their raw material consumption had been reduced from 1,500 kilograms/tonne of ammonia produced in 1996 to 1,300 kilograms/tonne; oil consumption had been reduced from 4.11 kilograms/tonne to 2.17 kilograms/tonne. For more information, visit: http://www.chinacp.com.

Sustainable development is fundamentally linked to the sustainability of cities. In the Asia-Pacific region, where the proportion of city dwellers is expected to increase by 20% between now and 2015, addressing the environmental impact of urban activities is a major objective for the maintenance of overall quality of life and well-being. Environment Canada together with the Asia-Pacific Economic Cooperation forum, Industry Canada, the Canadian International Development Agency, the National Round Table on the Environment and the Economy and others are implementing a Program of Action on Sustainable Cities, with special emphasis on pollution prevention and control.

The Asia-Pacific region will promote cleaner production in industrial sectors and has agreed to encourage the wider dissemination of information electronically through the Asia-Pacific Economic Cooperation (APEC) Virtual Centre for Environmental Technology Exchange and the APEC Center for Technology Exchange and Training for Small and Medium Enterprises. Environment Canada supported and contributed to the APEC Virtual Centre.

The Asia-Pacific Economic Cooperation (APEC) Industry, Science and Technology Working Group is focused on industrial voluntary action initiatives and market driven business opportunities associated with the environment. As a Canadian participant in the working group, the National Research Council is providing technical leadership and project management in the field of cleaner production processes to establish collaborative research and demonstration projects. The Canadian International Development Agency has partly funded the participation of some APEC members.

Over the 1998-1999 period, Asia-Pacific energy ministers adopted a work program to examine issues relating to investment in environmentally sound energy infrastructure, which was championed by Canada. Energy ministers also launched an initiative to promote information sharing on energy efficiency test standards for energy-using equipment with a view to standardizing measures where practical.

Under a Canadian International Development Agency funded project initiated in 1998-1999, Environment Canada continues to work with the Pakistan Environmental Protection Agency in building capacity to deal with oil and chemical spills (proper storage, handling and spill response practices), air quality improvement, hazardous products handling and environmental technology verification. A series of training sessions and workshops is being jointly organized and implemented.

The *Front commun québécois pour une gestion écologique des déchets* (FCQGED) Environmental Training and Pilot Project is a project led by the Canadian International Development Agency. Its intent is to increase the awareness of textile sector stakeholders of new pollution prevention measures and to implement pilot projects using these measures at a number of textile companies in Tunisia. The pilot projects have demonstrated that pollution control systems were an economic advantage for the firms, as initial investments are much lower than the cost of building treatment plants. Over 700 copies of the environmental audit of the textiles sector have been distributed, and there continue to be a large number of requests for it both in Tunisia and from other Maghrebian environmental associations.

CIDA Photo: Frank Keller

Moving Forward

Active engagement of all Canadians and establishment of the link between environmental and economic performance are crucial to the successful integration of the pollution prevention approach.

Sustainable development is not a fixed state and requires ongoing work. Efforts in the five targeted sectors of the federal Pollution Prevention Strategy are yielding signs of success, yet work must go on. A step-by-step approach based on continuous improvement is required to make measurable progress toward sustainable development. With a heightened focus on demonstrating environmental results, new and continuing initiatives will promote the use of processes, practices, materials, products and energy that avoid or minimize the creation of pollutants and waste.

Photo: Gilles Laroche

The results of this report, *Progress in Pollution Prevention 1998-1999*, confirm the Government of Canada's commitment "to expand the application of the federal Pollution Prevention Strategy across federal legislation, programs and policies" as stated in *Securing Our Future Together: Preparing Canada for the 21st Century* (Red Book II). Also, this report demonstrates that the techniques and processes used for pollution prevention are evolving to address national and global challenges.

The renewed *Canadian Environmental Protection Act* will provide the government with new powers to protect the environment and human health. The pollution prevention thrust of the renewed Act will help Canada contribute to sustainable development and enable Canadian industry to be more competitive internationally.

As the leading federal promoter of pollution prevention, Environment Canada will proceed to work with other federal departments in the development and implementation of effective environmental protection strategies, programs and projects. To foster this relationship and recognize achievements, all federal departments are encouraged to record their pollution prevention efforts during the 1999-2000 fiscal year for inclusion in the next annual progress report.

The Government of Canada will continue to strive for better understanding of the environmental and health threats posed by toxic substances and substances of concern. Better understanding will lead to prevention or reduction of threats to the environment

and health of Canadians. Federal departments will go on to address the present gaps in environmental baseline data and performance measures through improvements in tracking and data management capability. Working on an individual basis, federal departments are beginning to institutionalize performance indicators and measures pertinent to their operations.

Work will move forward with the provinces and territories to set Canada-wide standards for priority substances, including mercury, dioxins and furans, ozone, particulates and benzene.

Further partnerships will be pursued with industries and communities to reduce emissions of key pollutants. To promote pollution prevention in the marketplace, consumers will have more and better pollution prevention information for use when buying goods and services. The development and commercialization of innovative pollution prevention products, processes and technologies for application at home and abroad will remain a priority.

The pollution prevention successes achieved in 1998-1999 leave the Government of Canada well positioned to deliver a cleaner and healthier environment in the new millennium.

The Pollution Prevention Coordinating Committee welcomes all Canadians to become active in furthering the pollution prevention approach. Governments, municipalities, First Nations, business and academic communities, environmental groups and individual Canadians all play a vital role. By continuing to work together toward the goal of preventing pollution at the source, Canadians will protect and enhance the natural beauty and health of the environment and secure a healthy economy for generations to come.

On the Internet, view this report at:
www.ec.gc.ca/p2progress

Annual meeting of the Pollution Prevention Coordinating Committee in Vancouver, May 1999.

To view Pollution Prevention— A Federal Strategy for Action, visit:
www.ec.gc.ca/pollution/strategy

Appendix I

Pollution Prevention Coordinating Committee Membership List

ENVIRONMENT CANADA

National Office of Pollution Prevention
James Riordan (Chairperson)
John de Gonzague (Substitute Chairperson)
Ghislaine Dunberry (Coordinator)

Environmental Technology Advancement Directorate
Patricia Mitchell / Adrian Steenkamer

Regions
Rodger Albright
Atlantic Region
Thanh Thao Pham
Quebec Region
Brad Cumming / Ron Nobes
Ontario Region
David Noseworthy
Prairie & Northern Region
Snehal Lakhani / Andrew Green
Pacific & Yukon Region

Interdepartmental Network on Sustainable Development Strategies (INSDS)
Craig Ferguson / Stefania Trombetti

NATURAL RESOURCES CANADA
Richard Arseneault / Chris Callaghan

Federal Committee on Environmental Management Systems
Richard Arseneault

INDUSTRY CANADA
Environmental Affairs Branch
Giorgio Grappolini

NATIONAL DEFENCE
Directorate Environmental Protection
Holmer Berthiaume

CANADIAN INTERNATIONAL DEVELOPMENT AGENCY
Environment and Natural Resources Division, Policy Branch
Rasheda Nawaz

FISHERIES AND OCEANS CANADA
Real Property Management Directorate
Glen Packman / Susan Martin

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
Environmental Services
Monique Thériault

TRANSPORT CANADA
Environmental Affairs
Alec Simpson / Saleem Sattar

DEPARTMENT OF FOREIGN AFFAIRS AND INTERNATIONAL TRADE
Environmental Services
Jaye Shuttleworth

AGRICULTURE AND AGRI-FOOD CANADA
Corporate Services Branch, Asset Management and Capital Planning Directorate, Engineering Services
Pierre Laplante

Members can be reached through the Government of Canada Employees Directory at:
http://canada.gc.ca/search/direct500

Appendix II

Federal Department and Agency Contributors

Environment Canada

Agriculture and Agri-Food Canada

Atlantic Canada Opportunities Agency

Canadian Heritage

Canadian International Development Agency

Citizenship and Immigration Canada

Développement économique Canada

Fisheries and Oceans Canada

Foreign Affairs and International Trade

Health Canada

Human Resources Development Canada

Indian and Northern Affairs Canada

Industry Canada

Justice Canada

National Defence

National Research Council

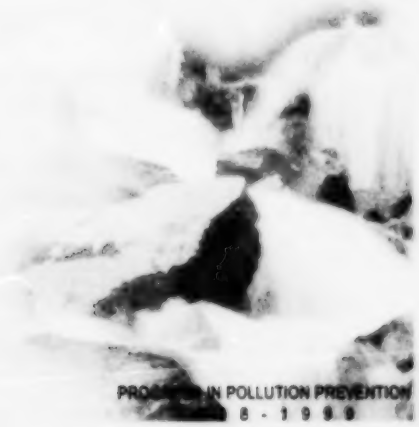
Natural Resources Canada

Natural Sciences and Engineering Research Council

Public Works and Government Services Canada

Statistics Canada

Transport Canada



Acknowledgements

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Steering Committee leading report preparation

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Giorgio Grappolini, Industry Canada
Holmer Berthiaume, National Defence
Saleem Sattar, Transport Canada
Sandi Nicoll, Secretariat Support, Environment Canada

This report was prepared by the Canadian Centre for Pollution Prevention Inc. based on project submissions and recommendations from various departments of the Government of Canada. Every effort has been made by the departments involved to ensure the information accurately reflects the projects and initiatives reported.

Any reference in this report to any specific commercial product, process or service by tradename, trademark, manufacturer or otherwise does not constitute its endorsement by the Government of Canada or the Canadian Centre for Pollution Prevention Inc.